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KEY STAGE
3

ALL TIERS

2009
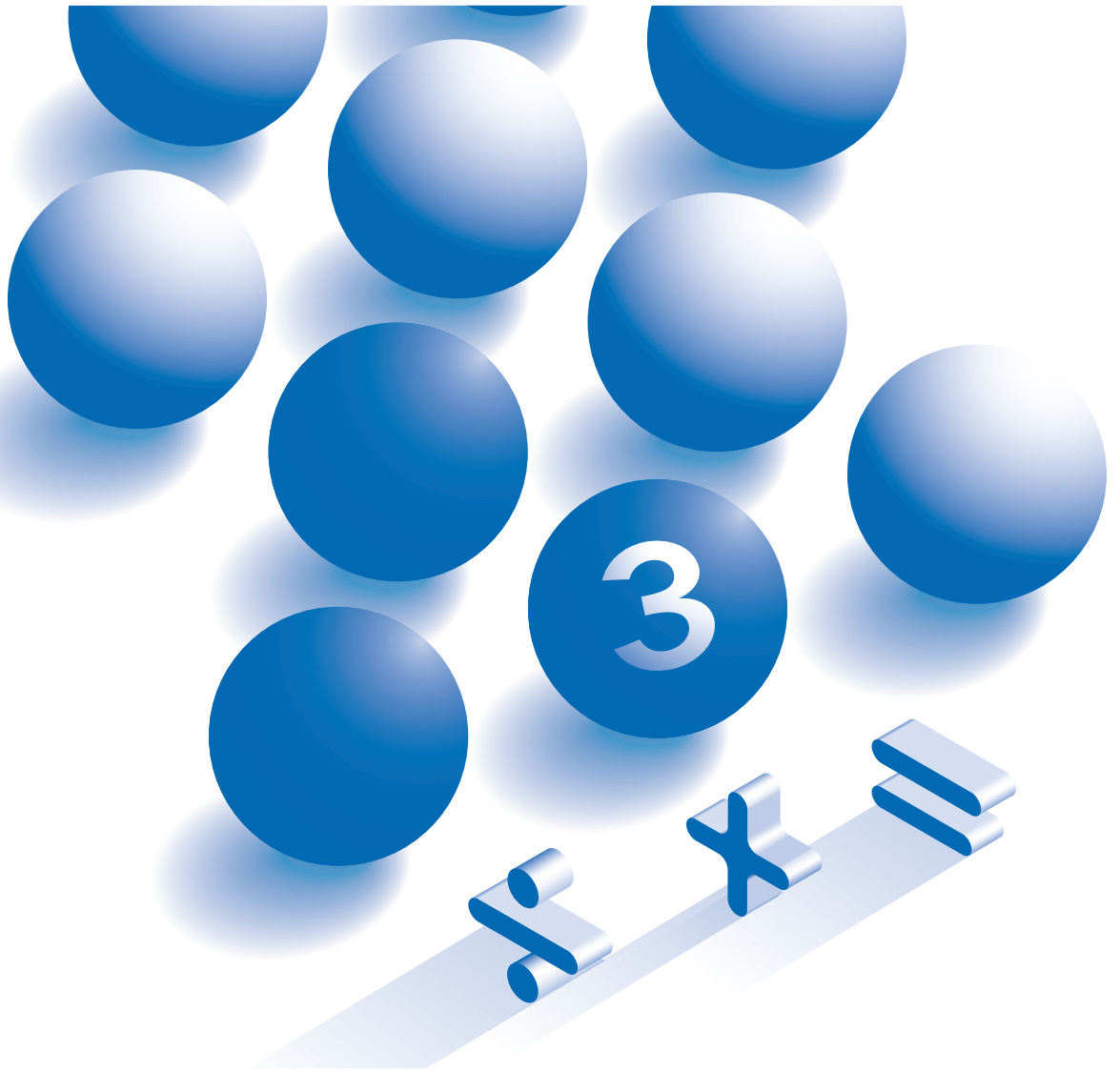
Mathematics tests

Mark scheme

for Paper 1
Tiers 3–5, 4–6, 5–7 and 6–8

3

National curriculum assessments

Introduction

This booklet contains the mark scheme for paper 1 at all tiers. The paper 2 mark scheme is printed in a separate booklet. Questions have been given names so that each one has a unique identifier irrespective of tier.

The structure of the mark schemes

The marking information for each question is set out in the form of tables, which start on page 10 of this booklet. The columns on the left-hand side of each table provide a quick reference to the tier, question number, question part and the total number of marks available for that question part.

The **'Correct response'** column usually includes two types of information:

■ a statement of the requirements for the award of each mark, with an indication of whether credit can be given for correct working, and whether the marks are independent or cumulative

■ examples of some different types of correct response, including the most common.

The **'Additional guidance'** column indicates alternative acceptable responses, and provides details of specific types of response that are unacceptable. Other guidance, such as when 'follow-through' is allowed, is provided as necessary.

Questions with a *Using and applying mathematics (UAM)* element are identified in the mark scheme by the symbol (U1). The number indicates the significance of using and applying mathematics in answering the question. The U number can be any whole number from 1 to the number of marks in the question.

For graphical and diagrammatic responses, including those in which judgements on accuracy are required, marking overlays have been provided as the centre pages of this booklet.

The 2009 key stage 3 mathematics tests and mark schemes were developed by the Test Development Team at Pearson Research and Assessment.

General guidance

Using the mark schemes

Answers that are numerically equivalent or algebraically equivalent are acceptable unless the mark scheme states otherwise.

In order to ensure consistency of marking, the most frequent procedural queries are listed on the following two pages with the prescribed correct action. This is followed by further guidance relating specifically to the marking of questions that involve money, negative numbers, time, measures, coordinates, probability or algebra. Unless otherwise specified in the mark scheme, markers should apply the following guidelines in all cases.

Recording marks awarded on the test paper

All questions, even those not attempted by the pupil, should be marked, with a 1 or a 0 entered in each marking space. Where 2m can be split into 1m gained and 1m lost, with no explicit order, then this will be recorded by the marker as $\begin{smallmatrix} 1 \\ 0 \end{smallmatrix}$
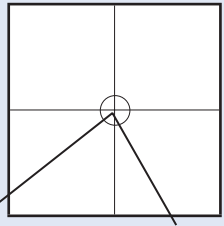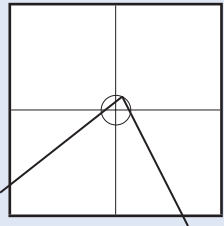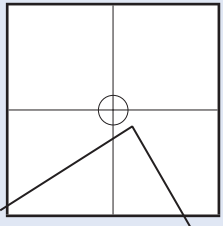
The total marks awarded for a double page should be written in the box at the bottom of the right-hand page, and the total number of marks obtained on the paper should be recorded on the front of the test paper.

A total of 120 marks is available in each of tiers 3–5, 4–6, 5–7 and 6–8.

Awarding levels

The sum of the marks gained on paper 1, paper 2 and the mental mathematics paper determines the level awarded. Level threshold tables, which show the mark ranges for the award of different levels, will be available on the NAA website *www.naa.org.uk/tests* from April 2009.

What if…	Marking procedure
The pupil's response is numerically or algebraically equivalent to the answer in the mark scheme.	Markers should award the mark unless the mark scheme states otherwise.
The pupil's response does not match closely any of the examples given.	Markers should use their judgement in deciding whether the response corresponds with the statement of the requirements given in the 'Correct response' column. Refer also to the 'Additional guidance'.
The pupil has responded in a non-standard way.	Calculations, formulae and written responses do not have to be set out in any particular format. Pupils may provide evidence in any form as long as its meaning can be understood. Diagrams, symbols or words are acceptable for explanations or for indicating a response. Any correct method of setting out working, however idiosyncratic, should be accepted. Provided there is no ambiguity, condone the continental practice of using a comma for a decimal point.
There appears to be a misreading affecting the working.	This is when the pupil misreads the information given in the question and uses different information without altering the original intention or difficulty level of the question. For each misread that occurs, deduct one mark only.
No answer is given in the expected place, but the correct answer is given elsewhere.	Where a pupil has shown understanding of the question, the mark(s) should be given. In particular, where a word or number response is expected, a pupil may meet the requirement by annotating a graph or labelling a diagram elsewhere in the question.

The final answer is wrong, but the correct answer is shown in the working.	Where appropriate, detailed guidance will be given in the mark scheme and must be adhered to. If no guidance is given, markers will need to examine each case to decide whether:	
	• the incorrect answer is due to a transcription error	If so, award the mark.
	• in questions not testing accuracy, the correct answer has been given but then rounded or truncated	If so, award the mark.
	• the pupil has continued to give redundant extra working which does not contradict work already done	If so, award the mark.
	• the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.	If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.

The pupil's answer is correct but the wrong working is shown.	A correct response should always be marked as correct unless the mark scheme states otherwise.

What if…	Marking procedure
The pupil has made a conceptual error.	In some questions, a method mark is available provided the pupil has made a computational, rather than conceptual, error. A computational error is a 'slip' such as writing $4 \times 6 = 18$ in an otherwise correct long multiplication. A conceptual error is a more serious misunderstanding of the relevant mathematics; when such an error is seen, no method marks may be awarded. Examples of conceptual errors are: • misunderstanding of place value, such as multiplying by 2 rather than 20 when calculating 35×27 • subtracting the smaller value from the larger in calculations such as $45 - 26$ to give the answer 21 • incorrect signs when working with negative numbers.
The correct response has been crossed or rubbed out and not replaced.	Any legible crossed or rubbed out work that has not been replaced should be marked according to the mark scheme. If the work is replaced, then crossed or rubbed out work should not be considered.
More than one answer is given.	If all answers given are correct (or a range of answers is given, all of which are correct), the mark should be awarded unless prohibited by the mark scheme. If both correct and incorrect responses are given, no mark should be awarded.
The pupil's answer correctly follows through from earlier incorrect work.	Follow-through marks may be awarded only when specifically stated in the mark scheme, but should not be allowed if the difficulty level of the question has been lowered. Either the correct response or an acceptable follow-through response should be marked as correct.
The answer is correct but, in a later part of the question, the pupil has contradicted this response.	A mark given for one part should not be disallowed for working or answers given in a different part, unless the mark scheme specifically states otherwise.
The pupil's accuracy is marginal according to the overlay provided.	Overlays can never be 100% accurate. However, provided the answer is within or touches the boundaries given, the mark(s) should be awarded.
The pupil has drawn lines which do not meet at the correct point.	Markers should interpret the phrase 'lines not accurate' to mean meeting within or on a circle of radius 2mm with centre at the correct point. within the circle accepted on the circle accepted outside the circle not accepted

Responses involving money

	✓ Accept	✗ Do not accept
Where the £ sign is given for example: £3.20, £7	✓ £3.20 £7 £7.00 Any unambiguous indication of the correct amount, eg £3.20p £3 20 pence £3 20 £3,20 £3-20 £3:20 320p with £ sign crossed out	✗ Incorrect placement of pounds or pence, eg £320 £320p Incorrect placement of decimal point, or incorrect use or omission of 0, eg £3.2 £3 200 £32 0 £3-2-0
Where the p sign is given for example: 40p	✓ 40p Any unambiguous indication of the correct amount, eg £0.40p £.40p £0.40 with p sign crossed out	✗ Incorrect or ambiguous use of pounds or pence, eg 0.40p £40p
Where no sign is given for example: £3.20, 40p	✓ £3.20 320p 40p £0.40 Any unambiguous indication of the correct amount in £ or p as shown above At **levels 3 and 4 only** also accept omission of units, eg 3.20 320 40 0.40	✗ Omission of final zero, eg 3.2 0.4

Responses involving negative numbers

	✓ Accept	✗ Do not accept
For example: −2		To avoid penalising the error below more than once within each question, do not award the mark for the *first* occurence of the error within each question. Where a question part carries more than one mark, only the final mark should be withheld. ✗ Incorrect notation, eg 2−

Responses involving time

	✓ Accept	✗ Do not accept
A time interval *for example:* 2 hours 30 minutes	✓ 2 hours 30 minutes Any unambiguous, correct indication, eg $2\frac{1}{2}$ hours 2.5 hours 2h 30 2h 30 min 2 30 Digital electronic time, ie 2:30	✗ Incorrect or ambiguous time interval, eg 2.3 hours 2.3h 2h 3 2.30 min 2.30 2-30 2,30 2.3
A specific time *for example:* 8:40am, 17:20	✓ 8:40am 8:40 twenty to nine Any unambiguous, correct indication, eg 08.40 8.40 0840 8 40 8-40 8,40 Unambiguous change to 12 or 24 hour clock, eg 17:20 as 5:20pm or 17:20pm	✗ Incorrect time, eg 8.4am 8.40pm Incorrect placement of separators, spaces, etc or incorrect use or omission of 0, eg 840 8:4:0 8.4 084 84

Responses involving measures

	✓ Accept	✗ Do not accept
Where units are given (eg kg, m, l) *for example:* 8.6kg	✓ 8.6kg Any unambiguous indication of the correct measurement, eg 8.60kg 8.6000kg 8kg 600g	✗ Incorrect or ambiguous use of units, eg 8600kg

Note

If a pupil leaves the answer box empty but writes the answer elsewhere on the page, then that answer must be consistent with the units given in the answer box and the conditions listed above.

If a pupil changes the unit given in the answer box, then their answer must be equivalent to the correct answer, using the unit they have chosen, unless otherwise indicated in the mark scheme.
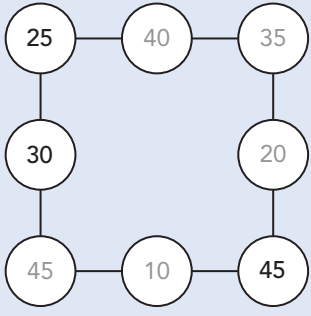
Responses involving coordinates

	✓ Accept	✗ Do not accept
For example: (5, 7)	✓ Unconventional notation, eg (05, 07) (five, seven) $\overset{x\ \ y}{(5,\ 7)}$ $(x=5,\ y=7)$	✗ Incorrect or ambiguous notation, eg (7, 5) $\overset{y\ \ x}{(7,\ 5)}$ $(5x,\ 7y)$ $(5^x,\ 7^y)$ $(x-5,\ y-7)$

Responses involving probability

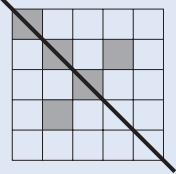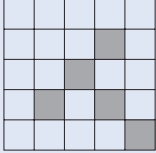|	✓ Accept	! Take care ✗ Do not accept
A numerical probability should be expressed as a decimal, fraction or percentage only. *for example:* $0.7 \quad \dfrac{7}{10} \quad 70\%$	✓ Equivalent decimals, fractions and percentages, eg 0.700 $\dfrac{70}{100}$ $\dfrac{35}{50}$ 70.0% ✓ A probability correctly expressed in one acceptable form which is then incorrectly converted, but is still less than 1 and greater than 0, eg $\dfrac{70}{100} = \dfrac{18}{25}$	The first **four** categories of error below should be ignored if accompanied by an acceptable response, but should not be accepted on their own. However, to avoid penalising the first **three** types of error below more than once within each question, do not award the mark for the *first* occurrence of each type of error unaccompanied by an acceptable response. Where a question part carries more than one mark, only the final mark should be withheld. ! A probability that is incorrectly expressed, eg 7 in 10 7 over 10 7 out of 10 7 from 10 ! A probability expressed as a percentage without a percentage sign. ! A fraction with other than integers in the numerator and/or denominator. ! A probability expressed as a ratio, eg 7:10 7:3 7 to 10 ✗ A probability greater than 1 or less than 0

Responses involving the use of algebra

	✓ Accept	! Take care ✗ Do not accept
For example: $2 + n$ $n + 2$ $2n$ $\dfrac{n}{2}$ n^2	✓ Unambiguous use of a different case or variable, eg N used for n x used for n	! Unconventional notation, eg $n \times 2$, or $2 \times n$, or $n2$ or $n + n$ for $2n$ $n \times n$ for n^2 $n \div 2$ for $\dfrac{n}{2}$ or $\dfrac{1}{2}n$ $2 + 1n$ for $2 + n$ $2 + 0n$ for 2 Within a question that demands simplification, do not accept as part of a final answer involving algebra. Accept within a method when awarding partial credit, or within an explanation or general working. ✗ Embedded values given when solving equations, eg in solving $3x + 2 = 32$, $3 \times 10 + 2 = 32$ for $x = 10$ To avoid penalising the two types of error below more than once within each question, do not award the mark for the *first* occurrence of each type within each question. Where a question part carries more than one mark, only the final mark should be withheld.
	✓ Words used to precede or follow equations or expressions, eg $t = n + 2$ tiles or tiles $= t = n + 2$ for $t = n + 2$	! Words or units used within equations or expressions, eg n tiles $+ 2$ n cm $+ 2$ Do not accept on their own. Ignore if accompanying an acceptable response.
	✓ Unambiguous letters used to indicate expressions, eg $t = n + 2$ for $n + 2$	✗ Ambiguous letters used to indicate expressions, eg $n = n + 2$ for $n + 2$

Tier & Question					
3–5	4–6	5–7	6–8		
1					

Circle totals

Mark	Correct response	Additional guidance
2m	Completes the diagram correctly, ie	
or **1m**	Gives two correct values	**!** *For 1m, follow-through from their 25* Accept follow-through for their 30 as 55 – their 25
U1		

Dishes

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
2						

				Mark	Correct response	Additional guidance
a				**1m**	£11	
b				**2m** or **1m**	£2.50 Gives the answer 2.5 or 250 or Shows the value 7.5(0) or 750 or Shows or implies a complete correct method with not more than one computational error eg • 1.50 + 2.50 + 3.50 = *7.00 (error)* Answer given as 3	

c				**1m**	Gives a correct pair of colours, in any order, ie
					
					Green and Orange
					
					or
					
					Blue and Red
						✓ *Unambiguous indication of colour*
						eg
						• G and O
						• B and R
						
						! *Response gives costs rather than colours*
						Withhold 1 mark only for the first occurrence.
						Allow costs given in pence
						eg
						• 1.50 and 3(.00)
						  2(.00) and 2.50
						• 150 and 300
						  200 and 250
						Mark as 0, 1

				1m Ⓤ1	Gives a correct pair of colours, other than any previously credited	

Five squares

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
3						
a				**1m**	Draws the correct line of symmetry, ie	**! Line not ruled, accurate or extended** Accept lines of at least 3 diagonals in length provided the pupil's intention is clear
b				**1m**	Completes the diagram correctly, ie	**! Squares not shaded** Accept provided indication of squares is unambiguous

Javelin

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
4						
a				**1m**	16 to 18 inclusive	
b				**1m**	4	
c				**1m**	17 to 19 inclusive	
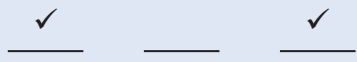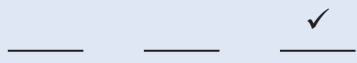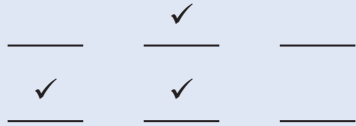
Tier & Question							**Digit cards**
3–5	4–6	5–7	6–8				
5				**Mark**	**Correct response**	**Additional guidance**	

1m Gives four of the digits to make a correct calculation eg • 7 + 8 = 15 • 5 + 6 = 11 • 9 + 9 = 18	**!** *Zero used at the end of a number* eg, for the first mark • 2 + 8 = 10 Penalise only the first occurrence
1m Gives four of the digits to make a correct calculation eg • 6 × 7 = 42 • 7 × 5 = 35 • 9 × 9 = 81	**✗** *Zero used or card left blank at the beginning of a two-digit number* eg, for the second mark, do not accept • 2 × 3 = 06
1m Gives five of the digits to make a correct calculation eg • 23 – 4 = 19 • 67 – 5 = 62 • 24 – 2 = 22	**✗** *Card left blank at the end of a number* eg, for the third mark, do not accept • 2 – 1 = 1
1m Gives four of the digits to make a correct calculation eg **U1** • 14 ÷ 2 = 7 • 24 ÷ 4 = 6 • 36 ÷ 6 = 6	**✗** *Extra digit inserted* eg, for the fourth mark, do not accept • 36 ÷ 2 = 18

Tier & Question							**Heights**
3–5	4–6	5–7	6–8				
6				**Mark**	**Correct response**	**Additional guidance**	

a	**1m** Indicates 1.8 metres, ie — ⊖ — —	
b	**1m** Indicates 7 metres, ie — ⊖ — —	
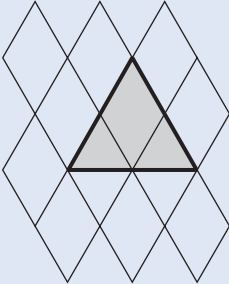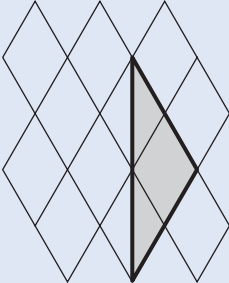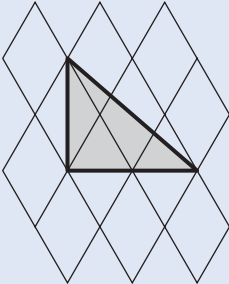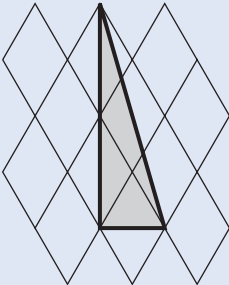
Change

Tier & Question						
3–5	4–6	5–7	6–8			
7				**Mark**	**Correct response**	**Additional guidance**
a				**1m**	3	
b				**2m**	Completes all three rows of the table correctly in any order eg	✓ *Cell that should contain zero left blank*

Number of 50p coins	Number of 20p coins	Number of 10p coins
2	3	0
2	2	2
2	1	4
2	0	6

or
1m Completes two rows of the table correctly

Doctors

Tier & Question						
3–5	4–6	5–7	6–8			
8	**1**			**Mark**	**Correct response**	**Additional guidance**
a	a			**1m**	Gives a value between 49 and 53 inclusive	✓ *Value qualified* eg, for part (a) • About 50
b	b			**1m**	Gives a value between 23 and 27 inclusive	
c	c			**1m**	Gives a possible reason eg • They might think their doctor's treatment is sometimes very good, but not at other times • They might not think that any of the possible answers is what they think • They don't have a doctor • They might not want to comment • They could be worried about giving an opinion • They may have only ever had one doctor • They don't always see the same doctor	✓ *Minimally acceptable reason* eg • Could be sometimes one category and sometimes another • They may not like the choices • If they're not sure • They don't see their doctor very often • They have just got a new doctor • Not relevant • They don't want to answer • They can't tell what is meant by good ✗ *Incomplete reason* eg • They don't know

Using tens

Tier & Question						
3–5	4–6	5–7	6–8			
9	2			Mark	Correct response	Additional guidance

1m	÷ 10	**!** *Correct operation indicated, but 10 omitted*
1m	÷ 10 ⟶ − 10	eg, for the first mark
1m	+ 10 ⟶ ÷ 10	• ÷
		Penalise only the first occurrence

Card shape

Tier & Question						
3–5	4–6	5–7	6–8			
10	3			Mark	Correct response	Additional guidance

2m	Indicates only the three correct shapes, ie	✓ *Unambiguous indication*
	✓ ___ ✓	eg
	___ ✓	• ✓ for yes and ✗ for no
or		
1m	Indicates any two of the correct shapes with the third incorrect or omitted	**!** *For 1 mark, response indicates only the three shapes showing the grey side of the shape, eg*
	or	
	Indicates the three correct shapes with not more than one other incorrect	✓ ✓ ✓
		Condone

Number lines

Tier & Question						
3–5	4–6	5–7	6–8			
11	4			Mark	Correct response	Additional guidance

1m	Gives both the values 2 and 8 in the correct positions	
1m	Gives the value −4 in the correct position	
1m	Gives the value (+)6 in the correct position	**!** *Follow-through from their −4*
		Accept the sum of their −4 and 10 provided their −4 is a negative number

Rhombus grid

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
12	5					
a	a			1m	12	
b	b			1m	Draws a correct triangle eg	! *Lines not ruled or accurate, or triangle not shaded* Accept provided the pupil's intention is clear ! *Vertices of triangle not on the intersections of the grid* Accept vertices within 2mm of the intersections of the grid ! *Other shapes drawn* As these may be trials, ignore

Missing digits

Tier & Question						
3–5	4–6	5–7	6–8	**Mark**	**Correct response**	**Additional guidance**
13	**6**					

1m	Completes the second calculation correctly, ie

$$\boxed{1}\ \boxed{7} \times 3 = \boxed{5}\ \boxed{1}$$

1m   Completes the third calculation correctly, ie

$$\boxed{1}\ \boxed{4} \times 3 = \boxed{4}\ \boxed{2}$$

or

$$\boxed{1}\ \boxed{5} \times 3 = \boxed{4}\ \boxed{5}$$

or

(U1)

$$\boxed{1}\ \boxed{6} \times 3 = \boxed{4}\ \boxed{8}$$

Additional guidance

! **Both digits placed in the same box**
eg
- $$\boxed{17}\ \boxed{} \times 3 = \boxed{5}\ \boxed{1}$$
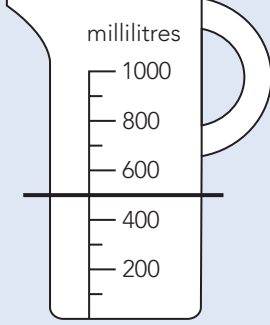
Condone

Clocks

Tier & Question						
3–5	4–6	5–7	6–8	**Mark**	**Correct response**	**Additional guidance**
14	**7**					
a	a			**1m**	10am	
b	b			**1m**	6pm	

Additional guidance

! **Indication of am or pm incorrect or omitted**
Condone omission of am or pm but do not accept incorrect times
eg, for part (a) accept
- 10 (o'clock)
eg, for part (a) do not accept
- 10pm
- 22:00
eg, for part (b) accept
- 6 (o'clock)
- 18:00
eg, for part (b) do not accept
- 6am
- 06:00

Sum of 80

Tier & Question						
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
15	**8**					

| | | | | 1m | Indicates Set A
and
gives a correct explanation
eg
• A = 74 and 80 – 74 = 6
  B = 90 and 90 – 80 = 10
• A is –3, –2, –1, (0) and B is +1, +2, +3, +4,
  so A is only 6 less than 80, but B is 10 more

(U1) | ✓ *Minimally acceptable explanation*
eg
• 6 and 10 seen
• 74 and 90 seen
• (–)3, (–)2, (–)1, (0) and 1, 2, 3, 4 seen

✗ *Incomplete or incorrect explanation*
eg
• A adds up to 74
• B is 10 more than 80
• A adds up to 74, B adds up to 110
• 17, 18 and 19 are all under 20 so A is smaller |

Number chains

Tier & Question						
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
16	**9**					

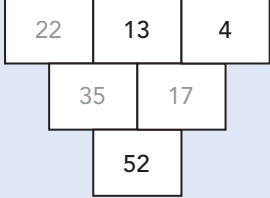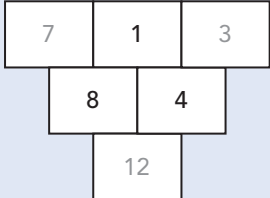| a | a | | | 1m | Gives the values 14 and 41 in the correct positions | |
| b | b | | | 1m | Shows a correct rule
eg
• × 3
• Multiply by 3
• Triple
• × 3 then + 0 | ✓ *Minimally acceptable rule*
eg
• Add the number 3 times
• Add on double itself
• Double then add the number
• It's the next power of 3
• 3×

! *Rule embedded or shown in working*
Accept provided a correct rule is shown explicitly, even if an incorrect value for the next number in the chain is shown on the answer line
eg, accept
• 81 × 3 seen
• (4 – 1) × 81
eg, do not accept
• 81 + 81 + 81
• 81 × 2 + 81

✗ *Incomplete or incorrect rule*
eg
• 3
• +54
• 3n |

Making 1

Tier & Question						
3–5	4–6	5–7	6–8			
17	**10**	**1**		**Mark**	**Correct response**	**Additional guidance**

a	a	a	**2m**	Joins all four pairs of numbers correctly, ie	✗ *Number matched to more than one other* For 2m or 1m, do not accept as a correct match

or **1m**	Joins at least two pairs of numbers correctly

b	b	b	**2m**	Joins all four pairs of numbers correctly, ie

or **1m**	Joins at least two pairs of numbers correctly

T-shirts

Tier & Question						
3–5	4–6	5–7	6–8			
18	**11**	**2**		**Mark**	**Correct response**	**Additional guidance**

a	a	a	**1m**	$\frac{1}{5}$ or equivalent probability	
b	b	b	**1m**	$\frac{2}{3}$ or equivalent probability	! *Value rounded* Accept 0.66(…) or 0.67 or the percentage equivalents
c	c	c	**1m**	$\frac{1}{3}$ or equivalent probability	! *Value rounded* Accept 0.33(…) or the percentage equivalent

Water

Tier & Question						
3–5	4–6	5–7	6–8	**Mark**	**Correct response**	**Additional guidance**
19	**12**	**3**		1m	Indicates the value 500 on the jug, ie	✓ *Unambiguous indication*

millilitres
— 1000
— 800
— 600
— 400
— 200

U1

! *Inaccurate indication*
Accept provided the pupil's intention is clear

Boxes

Tier & Question						
3–5	4–6	5–7	6–8	**Mark**	**Correct response**	**Additional guidance**
20	**13**	**4**		2m	90	

or

1m Shows or implies a complete correct method with not more than one computational error
eg
- 72 ÷ 4 = 16 *(error)*
  72 + 16 = 88
- 72 ÷ 4 = 18
  18 × 5 = 80 *(error)*

U1

Percentages

Tier & Question						
3–5	4–6	5–7	6–8	**Mark**	**Correct response**	**Additional guidance**
a	a	a		1m	18	! *Throughout the question, incorrect use of % sign* eg • 18% 54% Penalise only the first occurrence
b	b	b		1m	54	! *For part (b) follow-through* Accept follow-through as their (a) × 3, or as 36 + their (a) provided the result is less than 360

Number grids

Tier & Question			
3–5	4–6	5–7	6–8
22	**15**	**6**	

Mark	Correct response	Additional guidance

1m Completes the first grid correctly, ie

22	13	4
	35	17
	52	

1m Completes the second grid correctly, ie

7	1	3
	8	4
	12	

(U1)

Angles in a triangle

Tier & Question			
3–5	4–6	5–7	6–8
23	**16**	**7**	

Mark	Correct response	Additional guidance

3m Gives all three correct angles, ie

$x = 90$
$y = 20$
$z = 20$

or

2m Gives any two correct angles

or

Gives $x = 90$ and $y = z$, provided this value is < 90 and > 0

or

1m Gives any one correct angle

or

Gives $y = z$, provided this value is < 90 and > 0

Finding b

Tier & Question			
3–5	4–6	5–7	6–8
24	**17**	**8**	

Mark	Correct response	Additional guidance

2m
or
1m
	2
	
	Shows or implies that a = 5 and shows the intention to substitute this value into the second equation
	eg
	• $5 + 7 = 10 + b$
	• $b = 12 - 10$
	
	or
	
	Shows a complete correct method with not more than one computational error
	eg
	• $b = 11 - 6 + 7 - 10$
	• $a = 11 - 6 = 6$ *(error)*
	      $6 + 7 = 10 + b$
	        $b = 3$
		✘ *Conceptual error*
		  eg
		  • $a = 11 + 6 = 17$

Matching

Tier & Question			
3–5	4–6	5–7	6–8
	18	**9**	**1**

Mark	Correct response	Additional guidance
1m	Matches both instructions on the left to the equivalent instruction on the right, ie 	✘ *Instruction on the left matched to more than one instruction on the right*

Oak leaves

Tier & Question						
3–5	4–6	5–7	6–8			
	19	10	2	Mark	Correct response	Additional guidance

1m — Gives a correct reason from one of the five categories below that states or implies the problem, or suggests an improvement

The most common correct reasons:

Category 1: Refer to the number of leaves in the sample being too small
eg, problem
- The sample is too small
- Those 10 leaves might all be diseased
eg, improvement
- They should pick more than 10

Category 2: Refer to the number of trees in the sample being too small
eg, problem
- One oak tree might be different from others
- May be something wrong with that tree
eg, improvement
- They should use more than one tree

Category 3: Refer to the conditions in which the tree is growing being too uniform
eg, problem
- Different conditions may affect the leaves on other trees
- The soil might be very bad in that area
eg, improvement
- They should choose trees in different areas

Category 4: Refer to the area of the tree from which the leaves are picked being too small
eg, problem
- The leaves on higher branches might be different
- Those branches may not get enough light
eg, improvement
- They need leaves from all over the tree

Category 5: Refer to the period for picking the sample being too short
eg, problem
- The leaves may be different at different times of year
- It may be winter
eg, improvement
- They should collect throughout the year

Additional guidance

✓ *Minimally acceptable reason*
eg, problem
- Too small
- Only 10
- Not enough
- Just one
- Same growing conditions for the tree
- Other branches might be different
- Only the lowest branches
eg, improvement
- 100 is better
- More than one
- Need different areas
- Use other branches
- Collect at other times

! *For the first or the second reason, more than one reason given within one response*
Do not accept a correct response accompanied by an incorrect response from the same category. Otherwise ignore irrelevant or incorrect further responses.
If two correct reasons from different categories are given in one response space, both marks should be awarded
eg
- They need more trees from more areas
Mark as 1, 1

✗ *Incomplete reason that repeats the information given with no further explanation*
eg
- They are taking 10 leaves
- They are using one oak tree
- They are taking them from one part of the tree

1m

(U1)

Gives a correct reason from a different category from one already credited

Tier & Question					

Missing lengths

3–5	4–6	5–7	6–8		
	20	11	3	Mark	Correct response

Additional guidance

Mark	Correct response
2m	Gives both correct lengths, ie $x = 10$ and $y = 3.9$ or equivalent

or
1m
	Gives $y = 3.9$ or equivalent
	
	or
	
	Gives the two values transposed, ie
	
	$x = 3.9$ or equivalent and $y = 10$
	
	or
	
	Shows a complete correct method with not more than one computational error
	eg
	• $x = 10$, $10 - 6.1 = 4.9$ (error)
	• $4 \times 6.1 = 24.4$, $40 - 24.4 = 16.6$ (error)
	  $16.6 \div 4 = 4.15$, $4.15 + 6.1 = 10.25$
	• $40 \div 4 = 20$ (error)
	  $20 - 6.1 = 13.9$

Counters

Tier & Question						
3–5	4–6	5–7	6–8			
	21	**12**	**4**	Mark	Correct response	Additional guidance
	a	a	a	2m or 1m	Gives the value 3, with no evidence of an incorrect method Shows or implies a correct equation for the bags and shows or implies a correct first step of algebraic manipulation that either reduces the number of terms or collects variables on one side of the equation and numbers on the other eg • $6y + 1 = 4y + 7$ $6y - 4y = 7 - 1$ • $-2y + 7 = 1$ • $6y - 6 = 4y$ • $2y = 6$	! *Method used is trial and improvement* Note that no partial credit can be given
	b	b	b	2m or 1m Ⓤ1	5 Gives an answer of 4.(…) or Shows or implies a correct inequality using the expressions for the bags eg • $4k > k + 12$ • $3k > 12$ • $k > 4$	! *Method used is trial and improvement* Note that no partial credit can be given

Prize money

Tier & Question						
3–5	4–6	5–7	6–8			
	22	**13**	**5**	Mark	Correct response	Additional guidance

				2m or 1m	£ 490 000
					
					Shows the value 980 000
					
					or
					
					Shows a complete correct method with not more than one error
					eg
					• $1\,000\,000 - 20\,000 = 98\,000$ (error),
					  $98\,000 ÷ 2 = 49\,000$
						✓ *£ 490k*
						
						✗ *For 1m, one million taken to be 100 000*
						eg
						• $100\,000 - 20\,000 = 80\,000$,
						  $80\,000 ÷ 2 = 40\,000$
						
						✗ *For 1m, computational error that simplifies the division*
						eg
						• $1\,000\,000 - 20\,000 = 800\,000$,
						  $800\,000 ÷ 2 = 400\,000$

Correlation

Tier & Question						
3–5	4–6	5–7	6–8			
	23	**14**	**6**	**Mark**	**Correct response**	**Additional guidance**
	a	a	a	**1m**	Indicates B and gives a correct explanation The most common correct explanations: Refer to the 'slope' or 'gradient' of the points eg • The points make a pattern that is sloping upwards from left to right • The line of best fit would have a positive gradient Describe the relationship between the two variables eg • As the value on the x-axis increases, so does the value on the y-axis	✓ *Minimally acceptable explanation* eg • It slopes upwards • It goes up • It's like this ╱ ✗ *Incomplete explanation* eg • It slopes the positive way ✓ *Minimally acceptable explanation* eg • As one amount gets bigger, so does the other • It could be the higher the temperature, the more ice creams are sold ✗ *Incomplete explanation* eg • They both increase • It goes from the left-hand corner • It is slanted towards the right
	b	b	b	**1m**	Indicates A and gives a correct explanation The most common correct explanations: Refer to the points being closer to a line of best fit eg • The points are practically in a straight line, so the correlation is very strong • If you drew the line of best fit, the points in A would all be close to it but many would be further away in B Refer to the 'line' or sloping pattern being clearer to see eg • You can see the pattern of a very clear, almost straight line • In B you can see a pattern sloping upward, but it's not as clear	✓ *Minimally acceptable explanation* eg • They are closer to one line • In B they are less bunched together in a line ✗ *Incomplete explanation* eg • The points are closer together • In B they are more spread out ✓ *Minimally acceptable explanation* eg • They are in a straight line • The pattern sloping downwards is clear • In B the line is less easy to see • B's points are sloping upwards, but not as definitely as in A ✗ *Incomplete explanation* eg • The pattern is clearer • They are in a line

Shape rules

Tier & Question					
3–5	4–6	5–7	6–8		
	24	**15**	**7**	Mark	Correct response

Mark	Correct response	Additional guidance
2m	Completes all three rules correctly, ie $$H = \underline{N} + 1$$ $$A = \underline{H} \times 2$$ $$\underline{A} = 2N + 2$$	**!** *Throughout the question, unconventional notation* eg, for the first rule • $1 N + 1$ Condone **!** *Throughout the question, words used instead of letters* eg, for the second rule • $A = \underline{Height} \times 2$ Penalise only the first occurrence **!** *For the second rule, N + 1 used* Accept provided there is no ambiguity eg, accept • $(N + 1) \times 2$ eg, do not accept • $N + 1 \times 2$ ✓ *For the third rule, 2H used*
or 1m	Completes two rules correctly	

Fortieths

Tier & Question					
3–5	4–6	5–7	6–8		
	25	**16**	**8**	Mark	Correct response

Mark	Correct response	Additional guidance
1m	0.775	✗ *Equivalent fractions*
1m	0.575	✓ *Follow-through as their value for the first mark – 0.2*

Tier & Question						

Expressions

3–5	4–6	5–7	6–8		
	26	**17**	**9**	**Mark**	**Correct response**

Additional guidance

	a	a	a	1m	Indicates $2n$ must be even and gives a correct explanation eg • Any whole number multiplied by two gives a number in the two times table, so is even • Odd × 2 = even, even × 2 = even • 2 × odd is odd + odd = even 2 × even is even + even = even • All multiples of 2 are even • Halving an odd number does not give a whole number

(U1)

✓ *Minimally acceptable explanation*
eg
• × 2 gives even
• Doubling any number gives even
• All the numbers in the 2 times table are even

✗ *Incomplete explanation*
eg
• 2 × 1 = 2 which is even, and 2 × 2 = 4 which is also even
• Even × even is even
Even × odd is even
• Because when you add two odd numbers together you always make an even
• Because 2 is even

	b	b	b	1m	Indicates $3n$ could be odd or even and gives a correct explanation eg • 3 × 1 = 3 which is odd, but 3 × 2 = 6 which is even • Odd × 3 = odd, even × 3 = even • Multiples of 3 can be odd or even • An even or odd number can have a factor of 3

(U1)

✓ *Minimally acceptable explanation*
eg
• 3 × 1 = 3, 3 × 2 = 6
• If n is 5 you get odd, if n is 6, you get even
• 3 × some numbers = odd, but 3 × some numbers = even
• Because 3 goes into both odd and even numbers
• In the 3 times table there are odd and even numbers

✗ *Incomplete explanation*
eg
• $3n$ is sometimes odd and sometimes even
• Even × odd gives even
odd × odd gives odd
• 3, 6, 9, 12, 15…..

Ratio

Tier & Question					
3–5	4–6	5–7	6–8		
	27	**18**	**10**	Mark	Correct response

Tier & Question				Mark	Correct response	Additional guidance
		a	a	1m	8	

b b 1m Gives a correct number of black beads and white beads such that:
the number of black beads is $(3n - 1)$ and
the number of white beads is $(2n - 3)$, provided $n \geq 2$
eg
- 5 black beads, 1 white bead
- 8 black beads, 3 white beads
- 11 black beads, 5 white beads

(U1)

Markers may find the following list of correct examples helpful:

Black	White
5	1
8	3
11	5
14	7
17	9
20	11

Powers

Tier & Question					
3–5	4–6	5–7	6–8		
	28	**19**	**11**	Mark	Correct response

1m Gives a correct justification that the difference between 3^2 and 3^3 is 18
eg
- $3^2 = 9$, $3^3 = 27$, and $27 - 9 = 18$
- $3^3 - 3^2 = 3^2(3 - 1)$
           $= 9 \times 2$
           $= 18$

✓ *Minimally acceptable justification*
eg
- $27 - 9$
- $9 + 18 = 27$

✗ *Incomplete or incorrect justification*
eg
- $3^2 = 9$, $3^3 = 27$
- $3^3 - 3^2 = 18$
- $9 - 27 = 18$

Tier & Question						
3–5	4–6	5–7	6–8			
		20	12	**Mark**	**Correct response**	**Additional guidance**

Sorting primes

			U1	**1m**	Identifies a value, n, such that n is prime, and shows that $2n + 1$ is not prime to demonstrate that the statement is incorrect	

Correct response

Identifies a value, n, such that n is prime, and shows that $2n + 1$ is not prime to demonstrate that the statement is incorrect

eg

- 7 is a prime number, but $2 \times 7 + 1 = 15$, and 15 is not a prime number
- 13 is prime, but 27 is not

Additional guidance

✓ *Minimally acceptable response*

eg
- 7, 15
- $2 \times 13 + 1 = 27$

✗ *Incomplete or incorrect response*

eg
- $2 \times n$ is even, even + 1 is odd and not all odd numbers are prime

! *More than one example given*

Accept provided a counter example is clearly identified

eg, accept
- 11 gives 23
  13 gives 27 so this one

eg, do not accept
- 11 gives 23
  13 gives 27

Markers may find the following list of correct examples helpful ($n < 100$):

n	$2n + 1$
7	15
13	27
17	35
19	39
31	63
37	75
43	87
47	95
59	119
61	123
67	135
71	143
73	147
79	159
97	195

Tier & Question							Score
3–5	4–6	5–7	6–8				
		21	13	Mark	Correct response	Additional guidance	

		a	a	2m or 1m	11 Shows the values 56 and 45 or Gives an answer of 9 [the points gained in round 5]	
		b	b	1m U1	Gives a response that states or implies that Derek gained the same number of points in each round eg • He got the same number of points in each round • To keep the gradient the same, an equal number needs to be added each time • For every round going across, the line must have gone up the graph in equal steps	✓ *Minimally acceptable response* eg • Same • Equal • No change • The total increases by the same number in each round • He gained 10 points each round ✗ *Incomplete or incorrect response* eg • He gets about the same number of points in each round • It increases by the same number in each round • His points were consistent • A steady increase • He gets maximum points each round • The line could be horizontal

Tier & Question						

Rhombus

3–5	4–6	5–7	6–8		
		22	**14**	**Mark**	**Correct response**

Additional guidance

Mark	Correct response	Additional guidance

2m
or
1m
	24
	
	Shows a correct method with not more than one computational error
	
	The most common correct methods:
	
	Calculate the area of the rhombus as half the area of the rectangle
	eg
	• $\frac{1}{2}(6 \times 8)$
	• $48 \div 2$
	
	Work with 2 or 4 triangles
	eg
	• Area of one little triangle is half of 3×4, there are 4 little triangles so $\times 4$
	• $(6 \times 4) \div 2 = 14$ *(error)*, $14 \times 2 = 28$
	• 8 triangles altogether, so one is $48 \div 8 = 7$ *(error)*, 4 shaded so $4 \times 7 = 28$
	• Area of rectangle: $6 \times 8 = 48$,
	  Area of white triangle: $\frac{1}{2} \times 3 \times 4 = 6$
	  $4 \times 6 = 18$ *(error)*, answer 30
		✗ *Conceptual error*
		eg
		• Area of triangle given as base × height

1m	Shows the correct unit for their area or method eg • 24cm^2 • 2400mm^2	! *Area incorrect or omitted, but units given* If the mark(s) for the correct area have not been awarded, condone cm^2 seen for the third mark

Sums and products

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
		23	15			
		a	a	1m	Gives a pair of values with a negative sum and a positive product, ie where a and b are both negative eg • –2 and –1 • –9 and –10 • –0.5 and $-\frac{2}{5}$ • –3 and –3	
		b	b	1m	Gives a pair of values with a positive sum and a negative product, ie where a is positive, b is negative and $|a| > |b|$ eg • 2 and –1 • –9 and 10 • 0.5 and $-\frac{2}{5}$	

Mean

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
		24	16			
				2m or 1m	16 Shows the value 66 or Shows or implies a complete correct method with not more than one computational error eg • 6 × 11 – 5 × 10 • 5 × 10 = 50, 6 × 11 = 65 (error) so 15	**!** *For 1m, method uses arbitrary values with a mean of 10 for the original five numbers* Condone eg, for 1m accept • 8 + 9 + 10 + 11 + 12 = 49 (error) 6 × 11 – 49 = 17 **✗** *For 1m, error is in the number of values in the set after one is added* eg • 5 × 11 = 55, 55 – 50 = 5
				(U1)		

Tier & Question						
3–5	4–6	5–7	6–8			**Simultaneous**
		25	17	Mark	Correct response	Additional guidance

3m   Gives both $x = 5$ and $y = \frac{5}{2}$ or equivalent and shows or implies a complete correct method for solving algebraically

eg
- $2x = 10$, $x = 5$ and $y = \frac{5}{2}$
- $3x + 18y = 60$
  $3x + 6y = 30$
  $12y = 30$, so $y = 2.5$ and $x = 5$
- $30 - 3x = 20 - x$
  $10 = 2x$, $x = 5$ and $y = 2.5$
- $3(20 - 6y) + 6y = 30$
  $60 - 18y + 6y = 30$
  $30 = 12y$, $y = 2.5$ and $x = 5$

✗ *Method used is trial and improvement*

or

2m   Gives either $x = 5$ or $y = \frac{5}{2}$ or equivalent and shows or implies a correct method for solving algebraically for that variable

eg
- $2x = 10$, $x = 5$
- $3x + 18y = 60$
  $3x + 6y = 30$
  $12y = 30$, so $y = 2.5$
- $30 - 3x = 20 - x$
  $10 = 2x$, $x = 5$
- $3(20 - 6y) + 6y = 30$
  $60 - 18y + 6y = 30$
  $30 = 12y$, $y = 2.5$

or

1m   Subtracts the two given equations to eliminate y, or forms two correct equations that would allow elimination of x

eg
- $2x = 10$
- $3x + 18y = 60$
  $3x + 6y = 30$

or

Attempts to solve by substitution and forms a correct equation in only one variable

eg
- $3(20 - 6y) + 6y = 30$
- $x + 30 - 3x = 20$

Shape

Tier & Question				
3–5	4–6	5–7	6–8	
		26	**18**	**Mark**

Mark | **Correct response** | **Additional guidance**

2m
or
1m

200, with no evidence of an incorrect method

Shows or implies that $a = 5$

or

Shows or implies that the area of one rectangle is 50

or

Shows a complete correct method with not more than one computational error
eg
- $16a = 80$, so $a = 6$ (error)
  $6 \times 12 = 72$, $72 \times 4 = 288$

! Error made in coefficient of a
Follow-through with this value provided
$12 \leq$ coefficient of $a \leq 20$
eg
- $12a$ (error) $= 80$, so $a = 6.6$
  $6.6 \times 13.2 \times 4 = 348$

Circle shapes

Tier & Question				
3–5	4–6	5–7	6–8	
		27	**19**	**Mark**

Mark | **Correct response** | **Additional guidance**

1m

Gives the correct expression for area A, ie
Area A = $y + 3w$

! Throughout the question, unconventional notation or unsimplified expressions
Condone
eg, for Area A, accept
- $y + 3 \times w$
- $y + w + w + w$
eg, for Area B, accept
- $1y + 1w$
- $y + 3w - 2w$

1m

Gives the correct expression for area B, ie
Area B = $y + w$

U1

! Answers for Area A and Area B transposed but otherwise correct
Mark as 0, 1

! Answers for Area A and Area B correct followed by incorrect further processing
Mark as 0, 1

Tier & Question					
3–5	4–6	5–7	6–8		
		28	20		

False

				Mark	**Correct response**

Additional guidance

	a	**2m**

Gives a correct explanation

The most common correct explanations:

Give a correct counter example
eg
- When $j = 2$ and $k = 3$, $(j + k)^2 = 25$, but $j^2 + k^2 = 13$
- If j is 2 and k is 3, $(2 + 3)(2 + 3) \neq 2^2 + 3^2$

✓ *Minimally acceptable explanation*
eg
- When $j = 2$ and $k = 3$ you get 25 and 13

✗ *Incomplete explanation*
eg
- When $j = 2$ and $k = 3$ you get different answers for each side, so it can't be right

Give the correct expansion of the expression
eg
- $(j + k)(j + k) = j^2 + 2jk + k^2$, not $j^2 + k^2$
- It should be $j^2 + jk + jk + k^2$
- $jk + jk$ has been missed out so it should be $j^2 + 2jk + k^2$

✓ *Minimally acceptable explanation*
eg
- $j^2 + 2jk + k^2$
- $j^2 + jk + jk + k^2$
- $2jk$ is missing

! *Correct expression equated to zero*
eg
- $j^2 + 2jk + k^2 = 0$
Condone

✗ *Incomplete or incorrect explanation*
eg
- $(j + k)(j + k) \neq j^2 + k^2$
- $(j + k)^2 = j^2 + jk + k^2$

Address the misconception
eg
- Both things in the first brackets should be multiplied by both things in the second brackets, but the pupil has done $j \times j$ and $k \times k$

✓ *Minimally acceptable explanation*
eg
- The pupil hasn't multiplied the j by the k or the k by the j
- There should be a jk term
- It should have been like this:
$$(j + k)(j + k)$$

✗ *Incomplete explanation*
eg
- There should be 3 terms in the answer
- The jks should be added
- You have to multiply everything in the second brackets by everything in the first brackets
- The pupil hasn't multiplied the first set of brackets by the second set properly
- You don't square j and k, you square the answer of $(j + k)$

False (cont)

Tier & Question					
3–5	4–6	5–7	6–8		
		28	**20**	**Mark**	**Correct response**

Additional guidance

				or **1m**	Shows a complete correct method with not more than one computational error when substituting values eg

				(U1)	

or **1m**

Shows a complete correct method with not more than one computational error when substituting values

eg

- If $j = 2$ and $k = 3$
  $(j + k)^2 = (2 + 3)^2 = 20$ *(error)*,
  $j^2 + k^2 = 4 + 9 = 13$

or

Shows or implies the four correct terms resulting from multiplying out the brackets, even if there is incorrect further working

eg

- j^2, jk, jk, k^2
- $j \times j + j \times k + j \times k + k \times k$

✗ *Conceptual error*

eg

- $3^2 = 6$

(U1)

---

b **1m**

Gives a correct counter example

eg

- $j = 0$
- $k = 0$
- Either j or k is zero
- Both j and k are zero
- It doesn't work if k is nought

(U1)

Tier & Question			
3–5	4–6	5–7	6–8
			21

Dice probability

Mark | **Correct response** | **Additional guidance**

2m
or
1m

$\frac{3}{4}$ or equivalent probability

Shows or implies the number of possible outcomes where the product is a multiple of 3
eg

-

×	3	4	5	6
3	9	12	15	18
4	12	16	20	24
5	15	20	25	30
6	18	24	30	36

-

	3	4	5	6
3	✓	✓	✓	✓
4	✓			✓
5	✓			✓
6	✓	✓	✓	✓

- 3 × 3, 3 × 4, 3 × 5, 3 × 6,
  4 × 3, 4 × 6,
  5 × 3, 5 × 6,
  6 × 3, 6 × 4, 6 × 5, 6 × 6

or

Shows a complete correct method but makes not more than two errors in identifying multiples of 3, then follows through to give their correct probability

-

×	3	4	5	6
3	9	12	15	18
4	12	16	20	24
5	15	20	25	30
6	18	24	30	36

(U2)   so $\frac{11}{16}$

Tier & Question					
3–5	4–6	5–7	6–8		
			22	Mark	Correct response

Solving

Additional guidance

2m　Gives $y = 20$
and
shows or implies a correct first step of algebraic manipulation that either removes the denominator or removes the brackets
eg

- $5(3y - 4) = 14y$
- $5(3y - 4) = 2y \times 7$
- $\dfrac{15y - 20}{2y} = 7$
- $\dfrac{5 \times 3y - 5 \times 4}{2y} = 7$
- $15y - 20 = 14y$
- $y - 20 = 0$

or

1m　Shows or implies a correct first step of algebraic manipulation that either removes the denominator or removes the brackets, even if there are other errors

....

2m　Gives $x = 5$ and $x = -5$, in either order
and
shows or implies the correct expansion of $(x + 4)(x - 4)$
eg

- $x^2 + 4x - 4x - 16$
-

	x	4
x	x^2	$4x$
-4	$-4x$	-16

- $x^2 - 16$
- $x^2 = 25$

or

1m　Shows or implies the correct expansion of $(x + 4)(x - 4)$, even if there are other errors

Tier & Question						
3–5	4–6	5–7	6–8			
			23	Mark	Correct response	Additional guidance

Marking overlay available

Distance from school

a | **2m**

Draws a correct graph within the tolerance as shown on the overlay that fulfils the following conditions:
1. All four points marked correctly, ie (2, 19), (3, 25), (4, 28) and (5, 29)
2. All points joined with a series of straight lines

or

1m

Shows or implies the values 19, 25, 28 and 29

eg
* Fulfils condition 1 only
* Marks the points (1.5, 19), (2.5, 25), (3.5, 28) and (4.5, 29) [ie uses midpoints of each range as x-coordinates]

or

Marks and joins at least three points correctly

or

Makes an error in marking one of the points, but follows through correctly for later points, and joins all their points

(U2)

! For 2m or 1m, points joined with a curve
Condone

! Follow-through
For 1m, accept the following values as follow-through:

Distance	Cf	f-t
2	19	none
3	25	6 + their 19
4	28	3 + their 25
5	29	1 + their 28

b | **1m**

Gives a value between 1.4 and 1.6 inclusive

or

Follows through from an incorrect total to give the correct median for their graph

✓ **Equivalent fractions or decimals**

! Follow-through
Follow-through can only be given for an increasing graph which reaches (5, y)

Tier & Question						
3–5	4–6	5–7	6–8			
			24	Mark	Correct response	Additional guidance

Marking overlay available

Coordinates

1m | Gives A as (0, –2)

1m | Gives B as (1, –1)

! Answers for A and B transposed but otherwise completely correct
If this is the only error, ie
gives A as (1, –1) and
gives B as (0, –2), mark as 0, 1

Similar triangles

Tier & Question			
3–5	4–6	5–7	6–8
			25

Mark	Correct response	Additional guidance
2m **or** **1m**	3, with no evidence of accurate or scale drawing Shows or implies the ratio 4 : 10 eg • 0.4 or equivalent seen • 2.5 or equivalent seen • $2 : 5 = ? : 7\frac{1}{2}$ • $7.5 \div 10 \times 4$ • 0.75×4 • $30 \div 10$	✘ *For 2m or 1m, evidence of accurate or scale drawing, with no other method*

Regions

Tier & Question			
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	Mark	Correct response	Additional guidance
a	**1m**	Gives the four correct letters, ie A, B, G and H, in any order	
b	**1m**	Gives the four correct letters, ie B, C, D and E, in any order	
c	**1m**	Gives the four correct letters, ie A, B, E and F, in any order	

Average speed

Tier & Question			
3–5	4–6	5–7	6–8
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Mark	Correct response	Additional guidance

2m	Gives a correct justification that the average speed is 20km per hour
	 eg
	 • 1km at 15km/h takes 60 ÷ 15 = 4 minutes,
	  1km at 30km/h takes 60 ÷ 30 = 2 minutes,
	  2km in 6 minutes = 20km in 60 minutes
	                = 20km per hour
	 • $\frac{1}{15} + \frac{1}{30} = \frac{3}{30}$
	             $= \frac{1}{10}$'
	  2km in $\frac{1}{10}$ hour = 20km in 1 hour
		✔ *For 2m, minimally acceptable justification*
		 eg
		  • 4 + 2 = 6 mins for 2km
		  • $\frac{1}{15} + \frac{1}{30} = \frac{1}{10}$ for 2km
		
		 ✘ *For 2m, incomplete justification*
		 eg
		  • 1km at 15km per hour takes
		    60 ÷ 15 = 4 mins,
		    1km at 30km per hour takes
		    60 ÷ 30 = 2 mins
		  • 6 mins for 2km, so it's 60 mins for 20km which is 20km per hour

or **1m**	Shows or implies that the journey time up the hill was 4 minutes or equivalent, and the journey time down the hill was 2 minutes or equivalent eg • 4, 2 seen • $\frac{1}{15}$, $\frac{1}{30}$ seen • 60 ÷ 15, 60 ÷ 30 seen	! *For 1m, total of 6 minutes or equivalent seen* As the total of 6 minutes can be calculated from the given 20km per hour, do not accept as implying 4 minutes and 2 minutes unless a correct method is also seen

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